

Response Under 37 C.F.R. 1.116

Applicant: VanWinkle T. Townsend

Serial No.: 09/847,751

Filed: May 2, 2001

Docket No.: L250.109.101 (FE-00494)

Title: TELEMETRY SYSTEM AND METHOD FOR ACOUSTIC ARRAYS**REMARKS**

The following remarks are made in response to the Final Office Action mailed March 7, 2006. In that Office Action, the Examiner rejected claims 12, 16-18, 20, and 22-24 under 35 U.S.C. §102(a) as being anticipated by Lin et al., "System Design and Optimization of Optical Amplified WDM-TDM Hybrid Polarization-Insensitive Fiber-Optic Michelson Interferometric Sensor", Journal of Lightwave Technology, Vol. 18, No. 3, March 2000 ("Lin"). Claims 1 and 5-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Nelson et al., U.S. Patent No. 4,628,493 ("Nelson") and McArthur et al., U.S. Patent No. 5,272,476 ("McArthur"). Claims 2 and 3 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claims 1 and 5-8 above, and further in view of Sonderegger et al., U.S. Patent No. 5,796,504 ("Sonderegger"). Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claims 1 and 5-8 above, and further in view of Guy, U.S. Patent No. 6,690,886 ("Guy"). Claim 9 was rejected under U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claims 1 and 5-8 above, and further in view of Nakamura et al., U.S. Patent No. 5,784,188 ("Nakamura"). Claims 10 and 11 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claims 1 and 5-8 above, and further in view of Green et al., U.S. Patent No. 6,515,939 ("Green"). Claims 13 and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Nelson. Claim 14 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Sonderegger. Claim 15 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Guy. Claims 19 and 25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Nakamura.

With this Response, Applicant respectfully traverses the Examiner's rejection of claims 1-25. Claims 1-25 remain pending in the application and are presented for reconsideration and allowance.

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Applicant's Reply to Examiner's Response to Arguments

In the Response to Arguments section of the Final Office Action, the Examiner stated the following:

The Applicant argues that if the Examiner contends that the sensors disclosed in Lin correspond to the optical modulators recited in claims 12 and 20, then Lin does not teach or suggest an array of sensors; if the Examiner contends that the sensors disclosed in Lin correspond to the array of sensors recited in claims 12 and 20, then Lin does not teach or suggest optical modulators. The Applicant argues that Lin does not teach or suggest both an array of sensors and a plurality of optical modulators as recited in claims 12 and 20. The Examiner disagrees. A closer look at FIG. 1 of Lin indicates that an interferometric sensor comprises several parts, namely, two arms (or legs) and a fiber coupler (FC). One of the arms is a reference arm and the other is the sensor (sic) part for sensing acoustic pressure. The fiber coupler acts as an interferometer and takes the reflected signals from the reference arm and the sensor arm and generates a phase modulation. That is, the sensor arm of FIG. 1 of Lin corresponds to the sensor recited in claims 12 and 20 and the fiber coupler corresponds to the modulator recited in claims 12 and 20. (Final Office Action at para. no. 13, pages 11-12) (emphasis in original).

Applicant respectfully disagrees with the Examiners statement above that "[o]ne of the arms is a reference arm and the other is the sensor (sic) part for sensing acoustic pressure." There is no teaching or suggestion in Lin that either of the arms senses acoustic pressure. In fact, the Examiner has acknowledged in the current Office Action that "[t]he differences between Lin et al. and the claimed invention are (a) Lin et al. does not specify the sensors as acoustic sensors" (Final Office Action at para. no. 4, page 3).

Applicant also respectfully disagrees with the Examiner's statements above that the fiber coupler corresponds to the modulator recited in the claims, and that "[t]he fiber coupler acts as an interferometer and takes the reflected signals from the reference arm and the sensor arm and generates a phase modulation." The Examiner has provided no citation or support for the Examiner's contention that the fiber coupler disclosed in Lin "acts as an interferometer". The Examiner has provided no citation or support for the Examiner's contention that the fiber coupler disclosed in Lin "generates a phase modulation". There is no teaching or suggestion in Lin that the fiber coupler acts as an interferometer, that the fiber coupler generates a phase modulation, or

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that the fiber coupler performs any functions other than coupling multiple fibers together. The fiber coupler disclosed in Lin is not an "optical modulator". The fiber coupler does not modulate a received stream of optical pulses based on received sensor information.

In the Response to Arguments section of the Final Office Action, the Examiner also stated the following:

The Applicant argues that if the Examiner contends that the sensors disclosed in Lin correspond to the plurality of subsystems recited in claim 1, then Lin does not teach or suggest a plurality of sensors; if the Examiner contends that the sensors disclosed in Lin correspond to the plurality of sensors recited in claim 1, then Lin does not teach or suggest a plurality of claim 1 (sic). The Applicant argues that Lin does not teach or suggest both a plurality of sensors **and** a plurality of subsystems as recited in claim 1, and Nelson and McArthur also fail to teach or suggest these limitations. The Examiner disagrees. As indicated above, a sensing arm of an interferometric sensor of Lin corresponds to a sensor of instant claim. Furthermore, Nelson et al., teaches in FIG. 1 telemetry modules correspond to subsystems of instant claim. (Final Office Action at para. no. 13, page 12) (emphasis in original).

Claim 1 recites "a plurality of acoustic sensors for receiving acoustic information and generating analog signals based on the received acoustic information", "a first plurality of subsystems coupled to at least a subset of the plurality of acoustic sensors, the first plurality of subsystems configured to receive the analog signals from the acoustic sensors and generate digital values based on the received analog signals, and "each subsystem in the first plurality of subsystems configured to modulate the first set of optical pulses based on the generated digital values and thereby generate a modulated optical pulse stream." In the above block quote, the Examiner did not identify any structure in Lin that allegedly corresponds to the first plurality of subsystems recited in claim 1. Lin does not teach or suggest a plurality of subsystems that receive analog signals from acoustic sensors, generate digital values based on the received analog signals, and modulate received optical pulses based on the generated digital values and thereby generate a modulated optical pulse stream.

The Examiner argues in the above block quote that the telemetry modules disclosed in Nelson correspond to the subsystems recited in claim 1. This argument is contradicted by the

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Examiner's admission earlier in the Office Action that "[t]he modified telemetry system of Lin et al. and Nelson et al. still fails to teach a plurality of subsystems for generating digital values based on analog signals received by the sensors." (Final Office Action at para. no. 4, page 4). Like the Lin reference, Nelson also does not teach or suggest a plurality of subsystems that receive analog signals from acoustic sensors, generate digital values based on the received analog signals, and modulate received optical pulses based on the generated digital values and thereby generate a modulated optical pulse stream.

The Examiner has also not identified any structure in McArthur that allegedly corresponds to the first plurality of subsystems recited in claim 1. Like the Lin and Nelson references, McArthur also does not teach or suggest a plurality of subsystems that receive analog signals from acoustic sensors, generate digital values based on the received analog signals, and modulate received optical pulses based on the generated digital values and thereby generate a modulated optical pulse stream.

In the Response to Arguments section of the Final Office Action, the Examiner also stated the following:

Regarding claim 9, the Applicant argues that there is no suggestion to combine the cited references. The Examiner disagrees. As stated above in the rejection, Nakamura et al., teaches in col. 1, ll. 15-21 that EA modulator is effective for transmitting a modulated signal in a wider frequency band over a longer distance without using any transponders. One of ordinary skill in the art would have been motivated to combine the teaching of Nakamura et al., with the modified telemetry system of Lin et al., Nelson et al., and McArthur et al., because of such desirable feature of EA modulator.

The Applicant also suggests that there is lack of evidence that an EA modulator modulates by passing or block optical pulses. Nakamura et al., may not teach the operation characteristic of EA modulator. However, it is well known to one of ordinary skill in the art. For example, Suzuki et al. (U.S. Patent No. 5,889,607), teaches in FIG. 2 that when the applied voltage is above -4 volts, the modulator passes light and when the applied voltage is below -4 volts, it blocks light transmission. (Office Action at para. no. 13, pages 12-13).

As the Examiner indicated in the above block quote, Nakamura discloses in the Background of the Invention section that an EA modulator is effective for transmitting a

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modulated signal in a wider frequency band over a longer distance without using any transponders. (Nakamura at col. 1, lines 15-21). The Examiner is apparently relying on this statement to combine any arbitrary disclosure in the references in any arbitrary manner, which is clearly contrary to established precedent. The Federal Circuit has stated that "there must be some suggestion, motivation, or teaching in the prior art that would have led a person of ordinary skill in the art to select the references and combine them in the way that would produce the claimed invention." *Karsten Manufacturing Corp. v. Cleveland Golf Co.*, 58 U.S.P.Q.2d 1286, 1293 (CAFC 2001). The Examiner has acknowledged that Lin, Nelson, and McArthur do not teach a modulator that modulates by passing and blocking optical signals. (Final Office Action at para. no. 7, page 7). Lin, Nelson, and McArthur do not include any teaching or suggestion that the systems disclosed therein could or should be modified to include modulators that pass and block received optical pulses, nor do Lin, Nelson, and McArthur include any suggestion that it would be desirable to add modulators that pass and block received optical pulses. There is no teaching or suggestion in Nakamura that the disclosed EA modulator could or should be used in a polarization-insensitive fiber-optic Michelson interferometric sensor (PIFOMIS) system like that disclosed in Lin. Rather, Nakamura discloses that the EA modulator is configured to be used in the digital transmission of moving pictures (See, e.g., Nakamura at col. 5, lines 9-13 and lines 63-67).

In addition, as Applicant has previously pointed out, the Examiner has not cited anything in Nakamura that teaches or suggests that the electro-absorption modulator (EA modulator) disclosed therein is configured to modulate a set of received optical pulses by passing and blocking optical pulses. In response, the Examiner has cited an additional reference, Suzuki et al. (U.S. Patent No. 5,889,607), and stated that Suzuki teaches in FIG. 2 that when the applied voltage is above -4 volts, the modulator passes light and when the applied voltage is below -4 volts, it blocks light transmission. Figure 2 of Suzuki is a diagram illustrating the operation of an optical pulse **generating** device that uses the optical modulator disclosed in Suzuki. (Suzuki at col. 4, lines 16-18) (emphasis added). There is no teaching or suggestion in Suzuki that the optical modulator of the pulse **generating** device modulates a set of optical pulses that are

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transmitted to the modulator by passing and blocking the received optical pulses. The cited references do not teach or suggest an optical modulator that modulates a received set of optical pulses based on digital sensor values by passing and blocking optical pulses.

Furthermore, the proposed modification to Lin by adding the electro-absorption (EA) modulators disclosed in Nakamura to the polarization-insensitive fiber-optic Michelson interferometric sensor (PIFOMIS) system disclosed in Lin would change the principle of operation of the system disclosed in Lin, as well as require a substantial reconstruction and redesign of the system. The MPEP states that “[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.” MPEP §2143.01, citing *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). The MPEP also states that, in the *Ratti* case, “[t]he court reversed the rejection holding the ‘suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate.’” MPEP §2143.01, citing *In re Ratti*, 270 F.2d at 813, 123 USPQ at 352.

Also, the Examiner has indicated that the fiber couplers disclosed in Lin correspond to the optical modulators recited in the claims. (See, e.g., Final Office Action at para. no. 13, pages 11-12. Thus, it appears that the Examiner is proposing that the fiber couplers disclosed in Lin would be replaced by the EA modulators disclosed in Nakamura. Such a modification would appear to render inoperable the system disclosed in Lin.

The Examiner’s specific rejections are addressed in further detail below.

35 U.S.C. §102 Rejections

The Examiner rejected claims 12, 16-18, 20, and 22-24 under 35 U.S.C. §102(a) as being anticipated by Lin et al., Journal of Lightwave Technology publication (“Lin”). Independent claim 12 is directed to a “system for remotely retrieving data from an **array of sensors**” and recites “a plurality of **optical modulators**, each optical modulator configured to receive one of the plurality of streams of optical pulses, each optical modulator configured to receive sensor

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information from at least one of the sensors, each optical modulator configured to modulate the received stream of optical pulses based on the received sensor information and thereby generate a modulated stream of optical pulses.” Independent claim 20 is directed to a “method for remotely retrieving data from an **array of sensors**” and recites “receiving the plurality of streams of optical pulses with a plurality of **optical modulators**” and “modulating each of the received streams of optical pulses with the plurality of optical modulators based on sensor information generated by the array of sensors, and thereby generating a plurality of modulated streams of optical pulses.” The Examiner previously admitted that Lin fails to teach modulators. (Office Action mailed 6/15/04 at page 4). The Examiner then stated in a later Office Action that “Lin et al. teaches in FIG. 1 Michelson interferometric sensors which act as modulators.” (Office Action mailed October 18, 2005, at page 2). Applicant addressed this argument in the previously filed Response, and addresses it again in the following paragraph.

Independent claims 12 and 20 each separately recite both an “array of sensors” and “a plurality of optical modulators”. If the Examiner contends that the sensors disclosed in Lin correspond to the optical modulators recited in claims 12 and 20, then Applicant respectfully submits that Lin does not teach or suggest an array of sensors. If the Examiner contends that the sensors disclosed in Lin correspond to the array of sensors recited in claims 12 and 20, then Applicant respectfully submits that Lin does not teach or suggest optical modulators. Lin does not teach or suggest both an array of sensors and a plurality of optical modulators as recited in claims 12 and 20.

Now, in the Final Office Action, the Examiner argues that “the fiber coupler acts as an interferometer and takes the reflected signals from the reference arm and the sensor arm and generates a phase modulation. That is, the sensor arm of FIG. 1 of Lin corresponds to the sensor recited in claims 12 and 20 and the fiber coupler corresponds to the modulator recited in claims 12 and 20.” (Final Office Action at para. no. 13, pages 11-12). As Applicant pointed out above, there is no disclosure in Lin to support the Examiner’s statement that the fiber coupler disclosed in Lin “acts as an interferometer”, or the Examiner’s statement that the fiber coupler disclosed in Lin “generates a phase modulation”. There is no teaching or suggestion in Lin that the fiber

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coupler acts as an interferometer, that the fiber coupler generates a phase modulation, or that the fiber coupler performs any functions other than coupling multiple fibers together. The fiber coupler disclosed in Lin is not an "optical modulator". The fiber coupler does not modulate a received stream of optical pulses based on received sensor information.

In view of the above, independent claims 12 and 20 are not taught or suggested by Lin. Applicant respectfully traverses the rejection of claims 12 and 20, and reconsideration and allowance of claims 12 and 20 is respectfully requested. Since dependent claims 16-18 further define patentably distinct claim 12, and claims 22-24 further define patentably distinct claim 20, and are further distinguishable over the cited prior art, these dependent claims are believed to be allowable over the cited references. Reconsideration and allowance of claims 16-18 and 22-24 is respectfully requested.

35 U.S.C. §103 Rejections

The Examiner rejected claims 1 and 5-8 under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Nelson et al, U.S. Patent No. 4,628,493 ("Nelson") and McArthur et al., U.S. Patent No. 5,272,476 ("McArthur"). Claim 1 recites "**a plurality of acoustic sensors for receiving acoustic information and generating analog signals based on the received acoustic information**", "**a first plurality of subsystems coupled to at least a subset of the plurality of acoustic sensors, the first plurality of subsystems configured to receive the analog signals from the acoustic sensors and generate digital values based on the received analog signals, and**" **"each subsystem in the first plurality of subsystems configured to modulate the first set of optical pulses based on the generated digital values and thereby generate a modulated optical pulse stream."**

The Examiner stated with respect to claim 1 that "Lin et al. discloses in FIG. 9 a telemetry system comprising a plurality of sensors arranged as a plurality of sensor arrays . . . a plurality of sensor arrays for modulating the optical pulses" (Final Office Action at para. no. 4, page 3). For the same reasons as discussed above with reference to claims 12 and 20, Lin fails to teach or suggest the above-quoted limitations of claim 1. If the Examiner contends that

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the sensors disclosed in Lin correspond to the plurality of subsystems recited in claim 1, then Applicant respectfully submits that Lin does not teach or suggest a plurality of sensors. If the Examiner contends that the sensors disclosed in Lin correspond to the plurality of sensors recited in claim 1, then Applicant respectfully submits that Lin does not teach or suggest a plurality of subsystems. Lin does not teach or suggest both a plurality of sensors **and** a plurality of subsystems as recited in claim 1. Lin does not teach or suggest a plurality of subsystems that receive analog signals from acoustic sensors, generate digital values based on the received analog signals, and modulate received optical pulses based on the generated digital values and thereby generate a modulated optical pulse stream. Nelson and McArthur also fail to teach or suggest these limitations.

The Examiner argues in the Response to Arguments section that the telemetry modules disclosed in Nelson correspond to the subsystems recited in claim 1. This argument is contradicted by the Examiner's admission earlier in the Office Action that "[t]he modified telemetry system of Lin et al. and Nelson et al. still fails to teach a plurality of subsystems for generating digital values based on analog signals received by the sensors." (Final Office Action at para. no. 4, page 4). Like the Lin reference, Nelson also does not teach or suggest a plurality of subsystems that receive analog signals from acoustic sensors, generate digital values based on the received analog signals, and modulate received optical pulses based on the generated digital values and thereby generate a modulated optical pulse stream.

The Examiner has also not identified any structure in McArthur that allegedly corresponds to the first plurality of subsystems recited in claim 1. Rather, the Examiner has simply stated that "McArthur et al. teaches to convert analog signal into digital format for transmission because digital signal has high noise immunity." (Final Office Action at para. no. 4, page 4). Like the Lin and Nelson references, McArthur also does not teach or suggest a plurality of subsystems that receive analog signals from acoustic sensors, generate digital values based on the received analog signals, and modulate received optical pulses based on the generated digital values and thereby generate a modulated optical pulse stream.

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In view of the above, independent claim 1 is not taught or suggested by Lin, Nelson, and McArthur, either alone, or in combination. Applicant respectfully traverses the rejection of claim 1, and reconsideration and allowance of claim 1 is respectfully requested.

Since dependent claims 5-8 further define patentably distinct claim 1, and are further distinguishable over the cited prior art, these dependent claims are believed to be allowable over the cited references. In addition, claim 8 recites "wherein each subsystem in the first plurality of subsystems includes an optical modulator for modulating the first set of optical pulses based on the generated digital values." For the same reasons as discussed above with reference to claims 12 and 20, the cited references do not teach or suggest this claim limitation. Reconsideration and allowance of claims 5-8 is respectfully requested.

Claims 2 and 3 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur, as applied to claims 1 and 5-8, and further in view of Sonderegger et al., U.S. Patent No. 5,796,504 ("Sonderegger"). Since dependent claims 2 and 3 further define patentably distinct claim 1, and are further distinguishable over the cited prior art, these dependent claims are believed to be allowable over the cited references. Reconsideration and allowance of claims 2 and 3 is respectfully requested.

Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur, as applied to claims 1, and 5-8, and further in view of Guy, U.S. Patent No. 6,690,886 ("Guy"). Since dependent claim 4 further defines patentably distinct claim 1; and is further distinguishable over the cited prior art, this dependent claim is believed to be allowable over the cited references. Reconsideration and allowance of claim 4 is respectfully requested.

Claim 9 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claim 1 above, and further in view of Nakamura et al., U.S. Patent No. 5,784,188 ("Nakamura"). Claim 9 recites "wherein each optical modulator modulates the first set of optical pulses by passing and blocking optical pulses in the first set of optical pulses." With respect to claim 9, the Examiner stated that:

The difference between Lin et al., Nelson et al. and McArthur et al. and the claimed invention is that Lin et al., Nelson et al. and McArthur et al. do not teach a modulator that modulates by passing and blocking optical signal.

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However, it is well known in the art that electro-absorption (EA) modulators are widely used for modulating optical signal by blocking (absorbing) or passing optical signal. For example, Nakamura et al. disclosed in FIG. 1 an EA modulator. (Final Office Action, para. no. 7, pages 6-7).

First, the Examiner has not cited anything in Nakamura that teaches or suggests that the electro-absorption modulator (EA modulator) disclosed therein is configured to modulate a set of optical pulses by passing and blocking optical pulses. Second, there is no suggestion to combine the cited references in the manner proposed by the Examiner. As pointed out above, the Examiner has acknowledged that Lin, Nelson, and McArthur do not teach a modulator that modulates by passing and blocking received optical pulses. Lin, Nelson, and McArthur do not include any teaching or suggestion that the systems disclosed therein could or should be modified to include modulators that pass and block received optical pulses, nor do Lin, Nelson, and McArthur include any suggestion that it would be desirable to add modulators that pass and block received optical pulses. There is no teaching or suggestion in Nakamura that the disclosed EA modulator could or should be used in a polarization-insensitive fiber-optic Michelson interferometric sensor (PIFOMIS) system like that disclosed in Lin. Rather, Nakamura discloses that the EA modulator is configured to be used in the digital transmission of moving pictures (See, e.g., Nakamura at col. 5, lines 9-13 and lines 63-67).

In addition, the proposed modification to Lin would also change the principle of operation disclosed in Lin, as well as require a substantial reconstruction and redesign of the system disclosed in Lin. See MPEP §2143.01.

In view of the above, dependent claim 9 is not taught or suggested by Lin, Nelson, McArthur, and Nakamura, either alone, or in combination. Since dependent claim 9 further limits patentably distinct claim 1, and is further distinguishable over the cited prior art, dependent claim 9 is believed to be allowable over the cited references. Applicant respectfully traverses the rejection of claim 9, and reconsideration and allowance of claim 9 is respectfully requested.

Claims 10 and 11 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claims 1 and 5-8, and further in view of Green et al., U.S.

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Patent No. 6,516,939 ("Green"). Since dependent claims 10 and 11 further define patentably distinct claim 1, and are further distinguishable over the cited prior art, these dependent claims are believed to be allowable over the cited references. Reconsideration and allowance of claims 10 and 11 is respectfully requested.

Claims 13 and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Nelson. Since dependent claim 13 further defines patentably distinct claim 12, and dependent claim 21 further defines patentably distinct claim 20, and these claims are further distinguishable over the cited prior art, these dependent claims are believed to be allowable over the cited references. Reconsideration and allowance of claims 13 and 21 is respectfully requested.

Claim 14 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Sonderegger. Since dependent claim 14 further defines patentably distinct claim 12, and is further distinguishable over the cited prior art, this dependent claim is believed to be allowable over the cited references. Reconsideration and allowance of claim 14 is respectfully requested.

Claim 15 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Guy. Since claim 15 further defines patentably distinct claim 12, and is further distinguishable over the cited prior art, this dependent claim is believed to be allowable over the cited references. Reconsideration and allowance of claim 15 is respectfully requested.

Claims 19 and 25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Nakamura. Claim 19 depends from claim 12 and recites "wherein each optical modulator modulates the received stream of optical pulses by passing and blocking optical pulses in the received stream." Claim 25 depends from claim 20 and recites "wherein each of the received streams of optical pulses is modulated by passing and blocking optical pulses in the received streams." With respect to claims 19 and 25, the Examiner stated that:

The difference between Lin et al. and the claimed invention is that Lin et al. does not teach to modulate received optical pulses by passing and block optical pulses. However, it is well known in the art that electro-absorption (EA) modulators are widely used for modulating optical signal by blocking (absorbing) or passing optical signal. For example, Nakamura et al. discloses in FIG. 1 an EA modulator. (Final Office Action at para. no. 12, pages 10-11).

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As previously discussed with reference to claim 9, the Examiner has not cited anything in Nakamura that teaches or suggests that the electro-absorption modulator (EA modulator) disclosed therein is configured to modulate a received set of optical pulses by passing and blocking optical pulses, and there is no suggestion to combine the cited references in the manner proposed by the Examiner. In addition, the proposed modification to Lin would also change the principle of operation disclosed in Lin, as well as require a substantial reconstruction and redesign of the system disclosed in Lin. See MPEP §2143.01.

In view of the above and since dependent claim 19 further defines patentably distinct claim 12, and dependent claim 25 further defines patentably distinct claim 20, and these claims are further distinguishable over the cited prior art, these dependent claims are believed to be allowable over the cited references. Reconsideration and allowance of claims 19 and 25 is respectfully requested.

CONCLUSION

In view of the above, Applicant respectfully submits that pending claims 1-25 are in form for allowance and are not taught or suggested by the cited references. Therefore, reconsideration and withdrawal of the rejections and allowance of claims 1-25 are respectfully requested.

No fees are required under 37 C.F.R. 1.16(b)(c). However, if such fees are required, the Patent Office is hereby authorized to charge Deposit Account No. 50-0471.

The Examiner is invited to contact the Applicant's representative at the below-listed telephone numbers to facilitate prosecution of this application.

Any inquiry regarding this Response should be directed to Jeff A. Holmen at Telephone No. (612) 573-0178, Facsimile No. (612) 573-2005. In addition, all correspondence should continue to be directed to the following address:

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Reg. No. 38,492

CERTIFICATE UNDER 37 C.F.R. 1.8:

The undersigned hereby certifies that this paper or papers, as described herein, are being transmitted via facsimile to Facsimile No. (571) 273-8300 on this 3rd day of May, 2006.

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